APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/940,432	08/29/2001	Norihiko Murata	213278US2	7057

22850 7590 03/23/2007 OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314	EXAMINER
	LAVIN, CHRISTOPHER L

ART UNIT	PAPER NUMBER
2624	

SHORTENED STATUTORY PERIOD OF RESPONSE	NOTIFICATION DATE	DELIVERY MODE
3 MONTHS	03/23/2007	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Notice of this Office communication was sent electronically on the above-indicated "Notification Date" and has a shortened statutory period for reply of 3 MONTHS from 03/23/2007.

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	Application No.	Applicant(s)
Office Action Summary	09/940,432	MURATA ET AL.
	Examiner	Art Unit	
	Christopher L. Lavin	2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _28 September 2006_.

2a)☒ This action is **FINAL.** 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _1-45_ is/are pending in the application.

　　4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) _1-45_ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on _29 August 2001_ is/are: a)☒ accepted or b)☐ objected to by the Examiner.

　　Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

　　Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

　　a)☒ All b)☐ Some * c)☐ None of:

　　　1.☒ Certified copies of the priority documents have been received.

　　　2.☐ Certified copies of the priority documents have been received in Application No. _____.

　　　3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

　　* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☐ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO/SB/08)
　　Paper No(s)/Mail Date _____.

4)☒ Interview Summary (PTO-413)
　　Paper No(s)/Mail Date. _03/08/07_.

5)☐ Notice of Informal Patent Application

6)☐ Other: _____.

DETAILED ACTION

1.   This action is in response to the interview held on March 8th, 2007.

Corrected Office Action

2.   As discovered during the interview, in the last office action dated 12/11/06 the

examiner identified the wrong reference in item 4 (item 5 in the current action), which

was a 102 rejection of claims 1, 6, 7, 9, 15, 16 and 28 – 45. In the last action the

examiner erroneously cited Lelong (5,444,458). The examiner intended to cite

Katayama (6,389,179). The error has been corrected, in this updated office action. The

time to reply therefore has been reset.

Claim Rejections - 35 USC § 102

3.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4.   Claims 1, 3-10 and 12-27 are rejected under 35 U.S.C. 102(e) as being

anticipated by Lelong et al. (US Patent 5,444,478 A).

Regarding claims 1 and 9, Lelong et al. discloses an image processing method

and apparatus for correcting image distortions, comprising the steps of:

a)   an input unit inputting a plurality of partially overlapping images of a

tangible object on an object plane, the plurality of partially overlapping images sharing a

common location of the tangible object and being created by capturing the tangible

object on the tangible object plane from different directions to the tangible object plane

(Figure 7);

b)   a correspondence detecting unit (Fig. 3,num. 200 is used in a "calibration"

in col. 16, line 63 via the method from col. 16, line 63 to col. 17, line 13) determining a

feature point ("seam" in col. 16, line 47 and shown in fig. 1E, label: "L_0") of one of the

plurality of partially overlapping images (in an "overlap zone" in col. 16, lines 49,50)

corresponding to the common location of the tangible object (The building of figures 7A

and 7B), and

c)   determining a matched point of one of the other partially overlapping

images corresponding to the feature point (to create "a perfect juxtapo-sition" in col. 16,

lines 66,67) so that a direction (Fig. 5B, direction or line "PM".) of the tangible object

plane (Fig. 5B, label" l_0") is calculated based on the feature point and the matched point

(Note that the above mentioned perfect juxtaposition is interpreted as matching features

of an image Si in fig. 7C to features of an image Sj in fig. 7C along a seam, L in fig. 7C

to create a seamless image as shown in fig. 7D where no seam is visible and respective

portions of the image such as the building and trees are matched to create "a

uniform...image" in col. 17, lines 12,13.), the tangible object plane (fig. 5A, label: "M")

being defined by a spatial orientation (of either the coordinate system ($y0, X_0, Z_0$) of an

image l_0 or the coordinate system (Y, Z, X, Z_0) of a camera, "P" as shown in fig. 5A) of the

tangible object;

d)   a standard image setting unit (fig. 3,num. 205) selecting one ("selecting one" in col. 6, line 46) of the plurality of partially overlapping images (Fig. 6, num. 205) as a standard image (via a "reference...camera" in col. 9, line 66 that creates a "source image" in col. 9, line 67 which is interpreted as the claimed standard image) whose image distortions are to be corrected (as shown in fig. 7D relative to fig. 7C.); and

e)   a distortion correcting unit (fig. 3,num. 112) generating a distortion-corrected image (fig. 7D) on a projection plane (or "projected in the...plane" in col. 8, line 11) by projecting the standard image onto the projection plane based on the direction of the tangible object plane such that image distortions in the standard image are eliminated.

Regarding claim 3, Lelong et al. discloses the image processing method according to claim 1 wherein in said selecting step, one of the plurality of partially overlapping images is automatically ("automatically" in col. 17, line 14) selected as the standard based on a direction of a straight-line pattern (fig. 1E, label: "L_0") contained in each image.

Claims 4 and 5 are rejected the same as claim 1. Thus, argument similar to that presented above for claim 1 is equally applicable to claims 4 and 5.

Claim 6 is rejected the same as claim 1. Thus, argument similar to that presented above for claim 1 is equally applicable to claim 6 except for the remaining limitations of:

a)   selecting one of the plurality of partially overlapping images as a standard image (Fig. 6, num. 205) that contains a smallest amount of image distortions (via a

"feedback" in col. 16, line 64 to create "a target image without any faults" in col. 16, lines 67,68. Thus, if a target image is created without any faults then the images that were used to create the target image also have no faults.) among the plurality of partially overlapping images; and

b)   combining the other partially overlapping images, which are projected (as shown in fig. 1A via a plurality of lines that radiate from point "P".) onto an image surface (Fig. 1A, label: "I_0") of the standard image with respect to each of the other partially overlapping images, so that a composite image (fig. 7D) is generated on the image surface so as to correct image distortions in the standard image (relative to the image of fig. 7C).

Claim 7 is rejected the same as claims 1 and 9. Thus, argument similar to that presented above for claims 1 and 9 is equally applicable to claim 7 except for the limitation disclosed in Lelong et al. of:

a)   an image composition unit ("Devices capable of realiz-ing these operations" in col. 17, lines 5,6 such as "perfect juxtapo-sition" in col. 16, lines 66,67.) combining (via a "joint" in col. 9, line 42) the other partially overlapping images, which are projected (as shown in fig. 1A via a plurality of lines that radiate from point "P".) onto an image surface (Fig. 1A, label: "I_0") of the standard image with respect to each of the other partially overlapping images, so that a composite image (fig. 7D) is generated on the image surface so as to correct image distortions in the standard image (relative to the image of fig. 7C).

Regarding claim 8, Lelong et al. discloses the image processing apparatus according to claim 7,

a)	wherein said standard image setting unit (fig. 3,num. 205) is configured such that a user (via fig. 3,num. 2) is required to select the standard image when taking the original image from one of the oblique directions (Fig. 7A shows an image of a scene at one angle and fig. 7B shows another image of the same scene at another angle so that when both images are combined as shown in fig. 7C distortions are shown because the images of the same scene were taken at different angles.), and

b)	wherein said image processing apparatus further comprises:

b1)	a notification unit (Fig. 21,num. 2) which notifies the user that the standard image is currently taken (via fig. 3,num. 205).

Regarding claim 10, Lelong et al. discloses the image processing apparatus according to claim 9, further comprising:

a)	a plurality of imaging units (Fig. 1G, label "P") which respectively input the plurality of partially overlapping images that are generated by taking the original image from the oblique directions.

Claims 12-14 are rejected the same as claims 3-5, respectively. Thus, argument similar to that presented above for claims 3-5 is equally applicable to claims 12-14, respectively.

Claim 15 is rejected the same as claims 1 and 9. Thus, argument similar to that

presented above for claims 1 and 9 is equally applicable to claim 15 except for the additional limitation of a computer-readable storage medium as disclosed in Lelong et al. in fig. 3, num, 210.

Claim 16 is rejected the same as claims 7 and 15. Thus, argument similar to that presented above for claims 7 and 15 is equally applicable to claim 16.

Regarding claim 17, Lelong et al. discloses the image processing method of claim 1, wherein said standard image is projected with a perspective projection matrix operation (or " 'perspective transform'" in col. 14, line 57).

Claims 18-22 are rejected the same as claim 17. Thus, argument similar to that presented above for claim 17 is equally applicable to claims 18-22.

Regarding claim 23, Lelong discloses the image processing method of claim 17, wherein said perspective projection matrix is calculated based on coordinates (or "coordinates" in col. 14, line 61) of at least four combinations of feature points of the standard image and matched points corresponding thereto (via a "4 X 4 matrix" in col. 14, line 62).

Regarding claim 24 see "least-squares method" in col. 15, line 17.

Regarding claim 25, Lelong et al. discloses the image processing method according to claim 1, wherein the tangible object is an image on a planar surface (or a "scene" in col. 2, line 27 that corresponds to the claimed image that has "surface area" in col. 2, line 27.

Regarding claim 27, Lelong discloses The image processing method according to claim 1, wherein the projection plane is parallel to the tangible object plane (Lelong's project plane is parallel to the imagine plane or virtual plane C_0).

5.   Claims 1, 6, 7, 9, 15, 16 and 28 – 45 are rejected under 35 U.S.C. 102(e) as being anticipated by Katayama et al. (US Patent 6,389,179 A).

Regarding claims 1 and 9, Lelong et al. discloses an image processing method and apparatus for correcting image distortions, comprising the steps of:

a)   an input unit inputting a plurality of partially overlapping images of a tangible object on an object plane, the plurality of partially overlapping images sharing a common location of the tangible object and being created by capturing the tangible object on the tangible object plane from different directions to the tangible object plane (Figure 6, item 100);

b)   a correspondence detecting unit determining a feature point of one of the plurality of partially overlapping images corresponding to the common location of the tangible object (Figure 10, item 172b), and

c)   determining a matched point of one of the other partially overlapping images corresponding to the feature point so that a direction of the tangible object plane is calculated based on the feature point and the matched point, the tangible object plane being defined by a spatial orientation of the tangible object (Figure 10, item 172b);

d)   a standard image setting unit selecting one of the plurality of partially

overlapping images as a standard image whose image distortions are to be corrected

(col. 10, lines 49 – 57); and

e)   a distortion correcting unit generating a distortion-corrected image on a

projection plane by projecting the standard image onto the projection plane based on

the direction of the tangible object plane such that image distortions in the standard

image are eliminated (Figures 7 and 8).

Claim 6 is rejected the same as claim 1. Thus, argument similar to that

presented above for claim 1 is equally applicable to claim 6 except for the remaining

limitations of:

a)   selecting one of the plurality of partially overlapping images as a standard

image that contains a smallest amount of image distortions among the plurality of

partially overlapping images (col. 10, lines 49 – 57); and

b)   combining the other partially overlapping images, which are projected onto

an image surface of the standard image with respect to each of the other partially

overlapping images, so that a composite image is generated on the image surface so as

to correct image distortions in the standard image (Figures 7 and 8).

Claim 7 is rejected the same as claims 1 and 9. Thus, argument similar to that

presented above for claims 1 and 9 is equally applicable to claim 7 except for the

limitation of:

a)   an image composition unit combining the other partially overlapping images,

which are projected onto an image surface of the standard image with respect to each

of the other partially overlapping images, so that a composite image is generated on the image surface so as to correct image distortions in the standard image (Figures 7 and 8).

Claim 15 is rejected the same as claims 1 and 9. Thus, argument similar to that presented above for claims 1 and 9 is equally applicable to claim 15..

Claim 16 is rejected the same as claims 7 and 15. Thus, argument similar to that presented above for claims 7 and 15 is equally applicable to claim 16.

In regards to claim 28, the image processing method according to claim 1, wherein the partially overlapping images are created by capturing the tangible object on the object plane using a same imaging unit (Figure 6).

In regards to claim 29, the image processing method according to claim 1, wherein the plurality of partially overlapping images are created by capturing the tangible object on the object plane at different time instants using a same image unit (Figure 6).

In regards to claim 30, the image processing method according to claim 1, wherein the plurality of partially overlapping images are created by moving a same imaging unit to capture the tangible object on the object plane from different directions to the tangible object plane (Figure 6).

In regards to claims 31, 34, 37, 40, and 43, claims 31, 34, 37, 40, and 43 are rejected for the same reasons as claim 28. The argument analogous to that presented above for claim 28 is applicable to claims 31, 34, 37, 40, and 43.

In regards to claims 32, 35, 38, 41, and 44, claims 32, 35, 38, 41, and 44 are

rejected for the same reasons as claim 29. The argument analogous to that presented

above for claim 29 is applicable to claims 32, 35, 38, 41, and 44.

In regards to claims 33, 36, 39, 42, and 45, claims 33, 36, 39, 42, and 45 are

rejected for the same reasons as claim 30. The argument analogous to that presented

above for claim 30 is applicable to claims 33, 36, 39, 42, and 45.

Claim Rejections - 35 USC § 103

6.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

7.   Claims 2 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Lelong et al. (US Patent 5,444,478 A) in view of Lee (US Patent 6,507,366 B1).

Regarding claim 2, Lelong et al. teaches the image processing method according

to claim 1 wherein in said selecting step, one of the plurality of partially overlapping

images is automatically (or "automatically" in col. 17, line 14) selected (via fig. 3,num. 2

which can be an automatic process that selects the standard image via fig. 3,num. 205.)

as the standard image.

Lelong et al. does not teach the remaining limitation of selecting the standard

image based on a ratio of an area of an object region to an entire area of each image,

but does teach an "automatic function" in col. 4, line 61 for "monitor[ing]" in col. 4, line

40. Thus, Lelong et al. suggests that an automatic process can be used for monitoring

automatically, but does not provide enough details on the automatic aspect of monitoring. Thus, one of ordinary skill in the art will be motivated to find an automatic process of monitoring so that a person is freed from monitoring a scene and so that the person can perform other duties.

Lee teaches "monitoring" in col. 1, line 12 and "automatically tracking" in the abstract as taught in Lelong et al. and the remaining limitation of claim 2:

a)   selecting (via fig. 3A,num. 360) based on a ratio of an area of an object region (or "region ratio" in col. 9, line 1) to an entire area (or "effective region" in col. 9, line 3) of each image.

It would have been obvious at the time the invention was made to one of ordinary skill in the art to modify Lelong et al.'s teaching of selecting the standard image and automatic monitoring with Lee's teaching of selecting or automatic tracking via fig. 3A,num. 360 so that Lelong et al's selecting the standard image, either one of I_j shown twice as shown in fig. 1E of Lelong et al. can be automatically tracked or monitored freeing a person from monitoring to perform other duties.

Claim 11 is rejected the same as claim 2. Thus, argument similar to that presented above for claim 2 is equally applicable to claim 11.

8.   Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lelong et al. (US Patent 5,444,478 A) in view of Honma (US Patent 6,304,313 B1).

Regarding claim 26, Lelong et al. does not teach the limitations of claim 26 of a smallest inclination angle of a viewing direction of the oblique imaging, but

does teach that "All the means for correct-ing the distortions of the objectives may be known to those skilled in the art." in col. 14, lines 4,5. Thus, Lelong et al. suggests to one of ordinary skill in the art that any means can be used to correct distortions of an objective.

Honma teaches a means of correcting a distortion using "perspective correction" in col. 13, line 20 of an objective or "optical lens" in col.13, line 20 and the remaining limitation of:

a smallest inclination angle (or "correctly face[d]" in col. 11, line 2) of a viewing direction (of a "camera" in col. 11, line 1.).

It would have been obvious at the time the invention was made to one of ordinary skill in the art to modify Lelong et al.'s teaching of a means to correct distortions of an objective with Honma's teaching of perspective correction, because Honma's teaching provides a "[simple] lens" in col. 13, line 21 with "less cost than conventional devices." in col. 13, line 25.

In addition, Honma's teaching of when correctly facing a camera, "perspec-tive correction is unnecessary" in col. 11, lines 3,4. Thus, extra time is saved by bypassing the step of perspective correction when the camera is correctly faced.

Response to Arguments

9.   Applicant's arguments filed 09/28/06 have been fully considered but they are not persuasive.

10.   Before addressing the applicant's arguments the examiner would first like to address the core issue. In the last office action dated 06/28/06, item 7, the examiner

stated that "Lelong never calculates an object plane **at** the tangible object plane, but merely uses a virtual plane l_0 of a virtual camera view C_0 ." It is believed that this statement is the basis for the applicant's amendments. However, the current language in the claims does not call for calculating an object plane at the tangible object plane. If this language was included in the claims Lelong would be overcome.

11.   The applicant's first argument focuses on the tangible object plane. This term is not defined in the specification and therefore can be considered to include just about anything that can be defined as a plane.

12.   In response the applicant's arguments dealing with the matched point, please see the rejection provided above. Lelong does find the matched point and determine the direction.

13.   In response the applicant's arguments dealing with "point" M. Point M can be considered a plane, that plane is simply defined by the orientation to other planes.

Conclusion

14.   Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher L. Lavin whose telephone number is 571-272-7392. The examiner can normally be reached on M - F (8:30 - 5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bhavesh M. Mehta can be reached on (571) 272-7453. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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